

WHAT IS CLAIMED IS:

1. An antenna arrangement for a wireless portable communication device,
the wireless portable communication device having a transceiver disposed on a
5 printed circuit board, the printed circuit board having first and second sides
opposite of each other, the antenna arrangement comprising:
 an antenna coupled to the transceiver; and
 a conducting element suspended substantially parallel to the first side
of the printed circuit board, the conducting element coupled to an electrical
10 ground of the printed circuit board,
 wherein the conducting element presents high impedance at operating
frequencies of the wireless portable communication device and diverts radio
frequency currents from the first side of the printed circuit board to the second
side of the printed circuit board such that a magnetic field produced by the
15 radio frequency currents on the first side of the printed circuit board is reduced
in a near-field.
2. The antenna arrangement of claim 1, further comprising a PIN diode
configured to couple the conducting element to the electrical ground of the
20 printed circuit board.
3. The antenna arrangement of claim 1, further comprising a plurality of
PIN diodes configured to couple the conducting element at a plurality of
locations to the electrical ground of the printed circuit board.
- 25 The antenna arrangement of claim 3, wherein a predetermined set of
PIN diodes of the plurality of PIN diodes are configured to couple the
conducting element to the electrical ground of the printed circuit board based
upon a predetermined range of the operating frequencies.

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5. The antenna arrangement of claim 1, further comprising a reactive element configured to couple the conducting element to the electrical ground of the printed circuit board.
- 5 6. The antenna arrangement of claim 1, further comprising a plurality of reactive elements configured to couple the conducting element at a plurality of locations to the electrical ground of the printed circuit board.
7. The antenna arrangement of claim 6, wherein a predetermined set of
10 reactive elements of the plurality of reactive elements are configured to couple the conducting element to the electrical ground of the printed circuit board based upon a predetermined range of the operating frequencies.
8. The antenna arrangement of claim 1, further comprising a varactor
15 diode configured to couple the conducting element to the electrical ground of the printed circuit board, the varactor diode further configured to receive a control signal to provide variable capacitance based upon a predetermined range of the operating frequencies.
- 20 9. The antenna arrangement of claim 1, wherein the conducting element is a metallic bezel configured to retain a display of the wireless portable communication device.

10. An antenna arrangement for a wireless portable communication device, the wireless portable communication device having a printed circuit board, the printed circuit board having first and second sides opposite of each other, a transceiver disposed on a printed circuit board, the antenna arrangement
5 comprising:
 an antenna coupled to the transceiver; and
 a plurality conducting elements suspended substantially parallel to the first side of the printed circuit board, at least one of the plurality of conducting elements coupled to an electrical ground of the printed circuit board,
10 wherein the at least conducting element of the plurality of conducting elements presents a high impedance at operating frequencies of the wireless portable communication device and diverts radio frequency currents from the first side of the printed circuit board to the second side of the printed circuit board the such that magnetic field produced by the radio frequency currents on
15 the first side of the printed circuit board is reduced in a near-field.
11. The antenna arrangement of claim 10, further comprising a plurality of PIN diodes, each of the plurality of PIN diode configured to couple a
20 corresponding conducting element of the plurality of conducting elements to the electrical ground of the printed circuit board.
12. The antenna arrangement of claim 11, wherein a predetermined set of PIN diodes of the plurality of PIN diodes are configured to couple the
25 corresponding conducting elements to the electrical ground of the printed circuit board based upon a predetermined range of the operating frequencies.
13. The antenna arrangement of claim 11, further comprising a plurality of reactive elements, each of the plurality of reactive elements configured to
30 couple a corresponding conducting element of the plurality of conducting elements to the electrical ground of the printed circuit board.

14. The antenna arrangement of claim 13, wherein a predetermined set of reactive elements of the plurality of reactive elements are configured to couple the corresponding conducting elements to the electrical ground of the printed circuit board based upon a predetermined range of the operating frequencies.

15. A method in a wireless portable communication device for reducing a magnetic field in a near-field on a first side of a printed circuit board, the printed circuit board further having a second side opposite the first side, the method comprising:
- 5 suspending a conducting element substantially parallel to the first side of the printed circuit board;
- coupling the conducting element to an electrical ground of the printed circuit board;
- presenting a high impedance at operating frequencies of the wireless
- 10 portable communication device with the conducting element; and
- diverting radio frequency currents to the second side of the printed circuit board from the first side of the printed circuit board.
16. The method of claim 15, wherein coupling the conducting element to
- 15 an electrical ground of the printed circuit board further comprises coupling the conducting element at a plurality of locations to the electrical ground of the printed circuit board.
17. The method of claim 16, wherein coupling the conducting element at a
- 20 plurality of locations to the electrical ground of the printed circuit board further comprises coupling the conducting element at a predetermined set of locations of the plurality of locations to the electrical ground of the printed circuit board based upon a predetermined range of the operating frequencies.
- 25 18. The method of claim 17, further comprising activating a plurality of PIN diodes to couple the conducting element at the predetermined set of locations of the plurality of locations to the electrical ground of the printed circuit board.

19. The method of claim 15, wherein coupling the conducting element to an electrical ground of the printed circuit board further comprises coupling the conducting element to the electrical ground of the printed circuit board using a PIN diode.

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20. The method of claim 15, wherein coupling the conducting element to an electrical ground of the printed circuit board further comprises coupling the conducting element to the electrical ground of the printed circuit board using a reactive element.